arthritis (RA)

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Purpose: To investigate certain aspects of the cellular immune status in RA patients (pts) and to correlate them the disease activity and the treatment. *Methods*: The trials has included 35 RA pts diagnosed according to revised ACR criteria, 1987, with active disease (DAS28 > 5.1). Pts clinical response has been assessed according to Eular criteria. First group was treated with methotrexate (MTX) in increased doses (up to 20 mg/week), while the other group received leflunomid (LF) in monotherapy (20 mh/day). Pts have been investigated prior to the change of therapy and subsequently after 6 weeks, 6 months and 1 year. *Results*: Results obtained show that RA patients who are unresponsive to MTX therapy show disturbances in their phagocyte system: large number of peripheral monocytes, developing intracellular oxidative activity, basally secreting cytokines and responsive to experimental bacterial stimuli; in vivo sensitized peripheral granulocytes, more closely responsive to bacterial stimuli.

Conclusions: LF and MTX, as inhibitors of nucleotide biosynthesis, are proved to be able to affect also the activity of nonproliferative cells, such as monocytes and granulocytes. RA pts are able to develop immune response against pathogens, in spite of their immunosuppressive therapy. During LF therapy, one may witness a rapid decline (at 6 weeks), of the intracellular oxidative activity of monocytes, tending to normalise. However, the effect is not persistent and the oxidative activity returns to the high values recorded six months before the initiation of therapy.

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Activation of immune dendritic cells by SiO_2 nanoparticles

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Due to their unique physico-chemical characteristics, nanoparticles (NPs) are now one of the leading technologies. As a non-metal oxide, silica (SiO_2) NPs have found extensive applications in industry and biomedicine. Aiming at evaluating their toxicological impact, we asked the question of SiO_2 NPs acting as immune adjuvants. Experiments were carried out on dendritic cells (DCs) which role is to initiate an immune response when antigens and "danger signals" are concomitantly present within their environment. Under these conditions, DCs undergo a maturation process. We therefore investigated whether SiO_2 NPs may alter this process.

Primary cultures of both human monocyte-derived DCs (MoDCs) and murine bone-marrow DCs (BMDCs) were exposed to 100 nm SiO_2 particles. Particles size and zeta potential were characterized using photon correlation spectroscopy (PCS) and observations revealed that NPs were found within the DCs after 24 h of exposure. Both DC types showed about 20% cell death and undergo a maturation process after 24 h of exposure to 100 μg/mL SiO_2 NPs. Maturation was evidenced by a significant upregulation of maturation markers at the DCs surface (CD40, CD86, CCR7, CD83) as well as by a significant release of cytokines (IL-6, IL-8, IL-10, TNF, CCL5, CXCL10).

Our results suggest that SiO_2 NPs may have an impact on the immune system function through the maturation of DCs. Further experiments will be dedicated to the understanding of signaling pathways involved in such a maturation process.

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Aflatoxins interfere in J774A.1 murine macrophages activation

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Purpose: Considering that aflatoxins (AF) are food contaminants exerting genotoxic, cancerogenic and immunotoxic properties and because only few studies have been performed about the immunotoxicity of AFB1 and AFM1 (Roda et al., 2010; Russo et al., 2010; Taranu et al., 2010) while no data are available regarding the immunotoxic effects of AFB2 and AFM2, the aim of the current study was evaluating the effects of AFB1, AFB2, AFM1 and AFM2, alone and in combination, on cultured LPS-activated J774A.1 macrophages.

Methods: J774A.1 macrophages were exposed to AFB1, AFB2, AFM1 and AFM2 (1–50 μM), alone and in combination, for 24, 48 and 72 h; cytotoxicity was evaluated through MTT assay. The production of nitric oxide (NO) by J774A.1 macrophages, previously exposed to aflatoxins (5–30 μM), alone and in combination, and stimulated with LPS (1 μg/ml) for 24 h was evaluated by Greiss reagent. Data were statistically examined.

Results of the study: AFB1 alone significantly reduced J774A.1 cell viability; combination with AFB2, AFM1 and AFM2 did not modify cell viability. AFB1, AFB2, AFM1, and AFM2 alone or in combination, significantly inhibited NO production. In conclusion, our results highlighted that these contaminants can interfere in immunomodulation; the effects of combination of aflatoxins are stronger than those induced by single mycotoxin suggesting interactions. The co-exposure due to food contamination may significantly affect immunoreactivity.

References

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